Henry (Fr. P.)

A CONTRIBUTION TO THE STUDY OF ANÆMIA

BY

FREDERICK P. HENRY, M.D.
PHYSICIAN TO THE EPISCOPAL HOSPITAL, PHILADELPHIA

[Reprinted from the ARCHIVES OF MEDICINE, October, 1882]

NEW YORK
G. P. PUTNAM'S SONS
27 & 29 WEST 23D STREET
1882

Compliments of P. Henry

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THE value of the hæmacytometer as a means of diagnosis, depends upon the wonderful recuperative power of the blood as regards its proportion of water. But for this tendency toward the maintenance of a certain quantity of blood in the vessels, irrespective of quality, the instrument would be of little value beyond determining the proportion of white cells to red; and where this recuperative power is interfered with, the examination, unless made by one who has had some experience in such matters, might be in the highest degree misleading. It is interfered with in choleraic conditions, that is, in states of the system in which the waste of water is greater than the supply; and also in conditions of imperfect ingestion and absorption of water, the waste of this fluid remaining at or below the normal.

A marked example of the latter of the two conditions above referred to, was furnished by a case of stenosis of the cardiac orifice of the stomach, which came under my notice at the Episcopal Hospital, in April, 1881.

William G., a Scotchman, æt. 56, had first experienced difficulty in deglutition five months before admission. He was then an inmate of a soldiers' home in Virginia, and the symptoms first appeared immediately after excessive vomiting casued by a

Reprinted from the ARCHIVES OF MEDICINE, Vol. viii, No. 3, Oct., 1882.

debauch. His family history was good. He had never had syphilis. He was greatly emaciated, having lost fifty pounds in five months, and suffered greatly from excessive thirst. He declared that water would not pass the stricture. With much difficulty a drop of blood was squeezed from a deep needle-puncture of the finger. It was very dark in color, and undoubtedly inspissated. An enumeration gave the following result:

No. red cells per cubic mm., 5,525,000.

Proportion of white cells to red, 1 to 550.

The normal average of red cells per cubic mm. being about 5,000,000, the above figures would have indicated an excellent state of blood nutrition, had it not been evident, from the clinical history and the physical state of the blood, that its proportion of water was greatly diminished. The term oligæmia would properly describe the condition then existing.

The patient was nourished with enemata until my colleague, Dr. Forbes, succeeded in passing a bougie into the stomach, after which he was able to take liquid food by the mouth, and rapidly gained flesh and strength. He soon obtained permission to go out on a pass, but returned exceedingly drunk, and was discharged.

As I did not make another count in this case, I can only surmise that the absorption of water and improvement in the patient's general condition were coincident with the establishment of a high degree of anæmia (oligocythæmia), a state of affairs that might be appropriately styled a medical paradox!

The more accurate diagnosis of anæmia attained through the use of the hæmacytometer, has led to certain modifications of our views regarding the pathology of several affections. By the term pathology as here used, I intend to imply the relation between the clinical history of a disease and its anatomical lesions real or supposed. By the process of blood-cell counting I have in more than one instance demonstrated that well-marked neurasthenia may exist independently of anæmia. I have also been able to confirm the observation that symptoms formerly attributed to

plethora are often due to anæmia. As to the existence of plethora I am extremely sceptical. I have never seen any morbid condition whatever that could be ascribed solely to an excessive number of red cells in the blood. I recognize a condition common to hearty eaters of animal food, which has been called plethora, but attribute its symptoms, for the most part, to albuminoid indigestion, and would classify it under the head of lithæmia. This condition has been admirably described by Fothergill.

The following case illustrates what might be termed spurious plethora.

Miss D., æt. 19, came to me complaining of a daily flushing of the face, coming on after meals, most marked in the evening, not accompanied with headache, and followed by pallor and slight sense of chilliness. At other times her extremities are warm; hands usually moist. The flushing was so annoying that she abstained from going out in the evening. On one occasion, a year before I saw her, an attack came on while she was in church—an evening service,—and was followed by a severe attack of syncope. A physician was sent for who did not think it safe to take her home until midnight.

The girl, when I saw her, was the picture of health, her complexion being remarkably good, her eyes bright, and her appearance in every respect that of a well-nourished individual. In spite of a large appetite she had a constant sense of weakness. Her menses were perfectly regular. As she had lived in a malarious district and there seemed to be a certain periodicity in the attacks, I prescribed a pill of quinine and valerianate of zinc.

A week later she returned and reported only a slight improvement. I then counted the blood globules with the following result.

No. red cells per cubic mm., 3,995,000.

Proportion of white cells to red, 1 to 530.

This showed the case to be one of decided anæmia, and I prescribed wine of iron and arsenic. Three weeks later I found her wonderfully improved. The flushing of the face had ceased entirely; the sense of languor had left her, and her spirits were any thing but low. I am confident that such cases have often

been described and treated as plethora. At the same time I admit, that some physicians of large experience have learned empirically that they are benefited by hæmatinics.

A desideratum in the diagnosis of anæmia is an instrument that will determine the specific gravity of small quantities (a drop or two) of blood. In the first of the two cases reported above, there was no difficulty in deciding that the specific gravity was abnormally great, but in slighter degrees of similar conditions this could not be determined. A color test is not corrective of the unavoidable inaccuracies of an enumeration, and is alone not nearly so accurate, as I have elsewhere argued.[1]

In conclusion, I would refer to an interesting observation made by myself for the first time, so far as I know, upon a property possessed by the red blood cells of permeating porous substances. I take the opportunity of introducing it here, although it has no direct bearing upon the subject of anæmia.

On Sept. 20, 1881, I performed the following experiment: After counting the blood cells in the usual manner, I threw upon a filter the same mixture from which the count was made, and then counted the cells of the filtrate. The first count gave the following result: No. red cells per cubic mm., 6,250,000; the second, that of the filtrate: No. red cells per cubic mm., 1,770,000.

The first count is about three and a half times greater than the second, and, therefore, more than one third of the red cells passed through the paper. There is little doubt that if larger quantities were dealt with, a still greater proportion of cells would pass. The whole amount of fluid thrown upon the filter in my experiment was 2,000 cubic mm. (about half a drachm), and although the utmost care was taken to place the liquid exactly in the centre of

[1] Cartwright Prize Essay, 1881.

the cone formed by the folded filter paper,[1] the immediate effect of the operation was the spreading of the fluid by imbibition on all sides upward for the space of an inch or more. This was equal to a reduction of the fluid to about one half of its bulk. If instead of half a drachm, I had been dealing with several ounces, I have no doubt that a much larger proportion of cells would have passed through. It is scarcely necessary to say that in making such an experiment the blood must first be mixed with a substance that will prevent its coagulation. I made use of the fluid which I am accustomed to employ in my blood-cell counts, a solution of sulpho-carbolate of sodium, sp. gr., 1020.

[1] The paper used was the imported German filter paper.

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